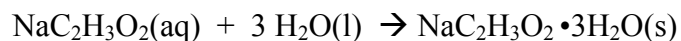


Heat of Reaction of Supersaturated Sodium Acetate



This reaction is exothermic and is used to generate heat for a hand warmer. In this experiment, you will determine the heat of reaction for this crystallization of a solution of supersaturated sodium acetate using a hand warmer and a makeshift calorimeter.

Procedure

Based on what we covered in class regarding calorimetry, develop a procedure to determine the enthalpy of reaction for the hand warmer. Record your procedure and data in your lab notebook.

Calculations

- 1) Calculate q_{reaction} in J.
- 2) Calculate $\Delta H_{\text{reaction}}$ in kJ/mole
- 3) The literature value for the heat of reaction is -19.7 kJ/mol. Calculate your percent error.

Questions

- 1) You assumed the measured mass of the hand warmer was pure supersaturated sodium acetate. Is this assumption valid? Explain why or why not.
- 2) Using your answer to Question 1, should your experimental heat of reaction be larger or smaller than the literature value? Justify your answer.
- 3) If a hand warmer had a few crystals of sodium acetate trihydrate present before it was agitated, how would this change the calculated heat of reaction? Explain your answer.
- 4) How would the experimental result change if a student kept their temperature probe in constant contact with the plastic cover of the hand warmer when they were measuring the temperature? Explain your answer.